



HALCON

a product of MVTec

“Ready to use” HPeek System Image For Raspberry Pi



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THE SYSTEM IMAGE IS INTENDED FOR EVALUATION AND DEMONSTRATION PURPOSES. IT SHOULD NOT BE USED FOR PRODUCTIVE WORK.

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More information about HPeek and HALCON can be found at: <https://www.halcon.com/>

About the “Ready to use” HPeek System Image

The **HPeek** system image provides an easy way to evaluate HALCON on embedded hardware. It also provides a good starting point for developing applications based on **HDevEngine**. This system image is targeted at the Raspberry Pi 3B+. It is flashed to a microSD card and booted on the Raspberry Pi. The Raspberry Pi can either run stand-alone or headless, i.e., without a keyboard and a monitor. In the latter case, the system is controlled from a Windows PC via the remote desktop protocol.

The following items are required:

Hardware

- Raspberry Pi 3B+
- microSD card (min. 8GB)
- microSD card reader
- Windows PC with Administrator privileges
- network patch cable (to establish a direct network connection between the PC and the Raspberry Pi)

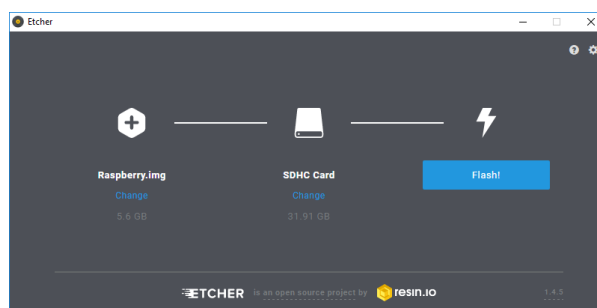
Software

- **“Ready to use” HPeek System Image** (the downloadable zip file contains this PDF and the system image)
- Imaging tool: This is required to flash the system image to the microSD card. There are numerous tools that can be used for this purpose. For the sake of simplicity, this documentation describes the process using Etcher. A portable version which runs without installation can be downloaded at <https://etcher.io>. MVTec is in no way affiliated with this freeware product and does not offer any support for it.

Getting Started

First, flash the system image to the microSD card:

- Insert the microSD card into a card reader connected to the PC.
- Run Etcher Portable.
- Select the HPeek system image for Raspberry Pi.
- Select the microSD card as the target drive.
- Flash the system image to the microSD card. Depending on the system this may take up to 20 minutes. After flashing the system image, Windows may suggest to format the microSD. This happens because Windows cannot natively access Linux partitions. Click *No* to keep the data on the microSD card as is.



The microSD card can now be booted in the Raspberry Pi:

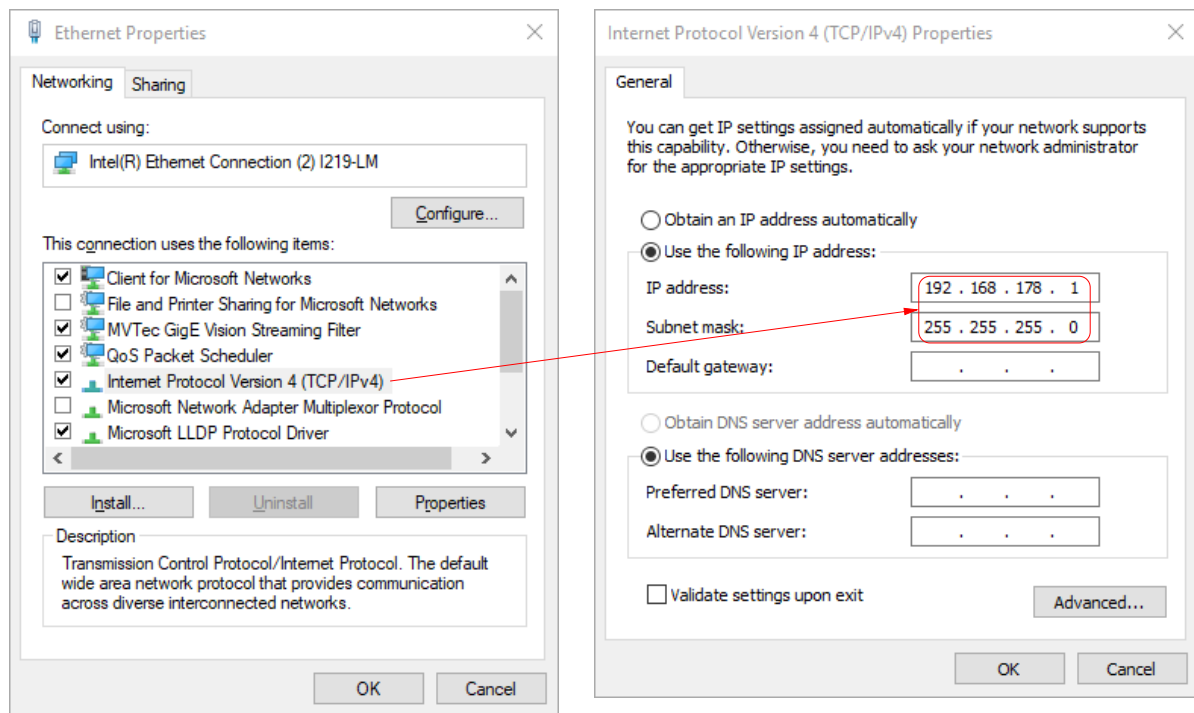
- Insert the microSD into the designated slot on the Raspberry Pi.
- Boot the Raspberry Pi by connecting the power supply.

If the Raspberry Pi runs stand-alone, you should be able to watch the system boot up on the connected monitor. You can skip the following two sections. Otherwise, wait for the Raspberry Pi to boot silently. This should take about 30 seconds.

Configuration (Headless Mode)

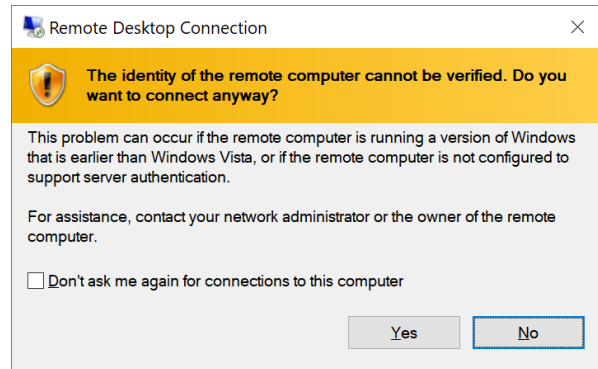
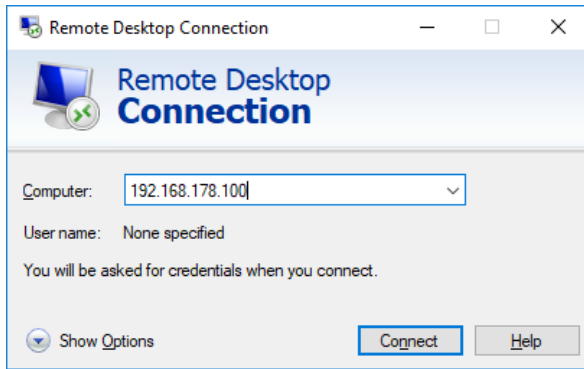
In case the Raspberry Pi runs headless, it can be controlled from the PC. Before the PC can talk to the Raspberry Pi, its network settings need to be adjusted.

- Connect the Raspberry Pi to the PC using the network patch cable.
- Configure the network address of the PC by right-clicking the network symbol at the task bar *Open Network & Internet settings*.
- Select *Change adapter options*. This step requires Administrator privileges.
- Right-click on the adapter that is connected to the Raspberry Pi and select *Properties*. The adapter is usually labelled »Ethernet«.
- Double-click on *Internet Protocol Version 4 (TCP/IPv4)*. Set the *IP address* to 192.168.178.1 and the *Subnet mask* to 255.255.255.0. Confirm the settings and close the dialog.



Connection (Headless Mode)

On the PC, start the application *Remote Desktop Connection* and enter the IP address of the Raspberry Pi (192.168.178.100) as the computer name. Click *Connect* and discard the identity warning by clicking *Yes*.



Login to the Raspberry Pi (user name: *pi*, password: *MVTec*). The PC should now display the desktop interface of the Raspberry Pi.

Starting HPeek

The desktop of the Raspberry Pi contains a folder with the *HPeek* application. Simply execute the script *run_overview.sh* inside that folder (option: *Execute in Terminal*). HPeek will demonstrate several machine vision applications using HALCON. To see the potential of HALCON's deep learning functionality, simply run *run_deep_learning.sh* for a demonstration of some examples.

Known Issues

The Raspberry Pi can easily overheat at full capacity, especially if not actively cooled down. In this case, *HPeek* may over time provide erroneous results or even freeze the system. To work around this problem, the *Raspbian HPeek System Image* is configured to clock the Raspberry Pi with a frequency of 1000MHz (see entry in */boot/config*). Please note that the clock speed has a considerable influence on the performance of the device.

If the Raspberry Pi cannot be reached in the network take care that your network is connected when booting the Raspberry Pi.